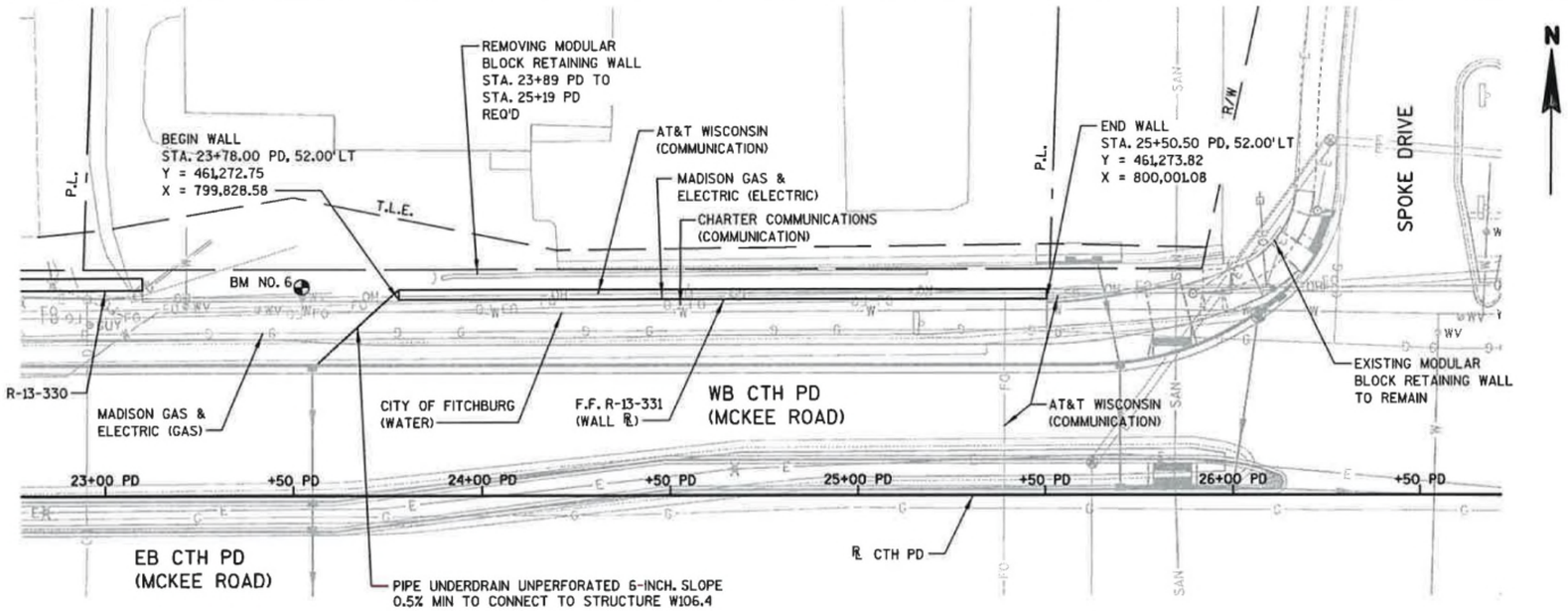
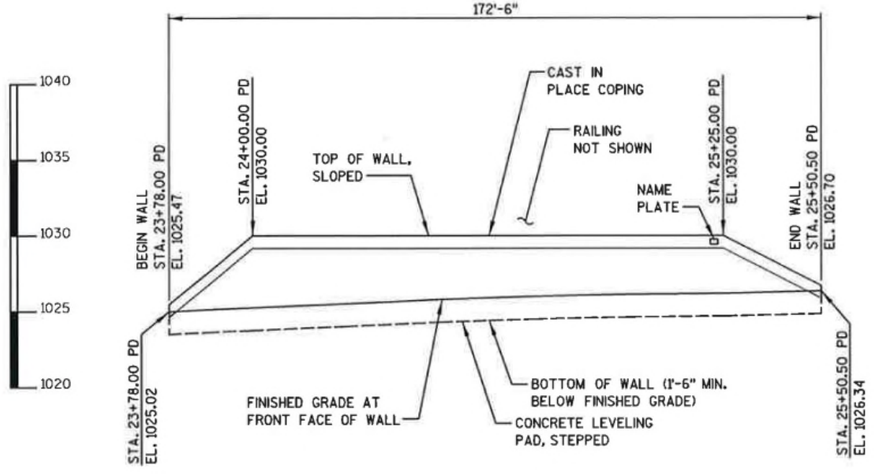



## PLAN
(MODULAR BLOCK GRAVITY WALL)




## ELEVATION
(LOOKING AT F.F. OF WALL)

## GEOMETRY TABLE

| STATION | OFFSET TO F.F. WALL | TOP OF WALL ELEV. | FINISHED GRADE ELEV. |
|---|---|---|---|
| 23+78.00 | 52.00' LT | 1025.47 | 1025.02 |
| 24+00.00 | 52.00' LT | 1030.00 | 1025.26 |
| 24+25.00 | 52.00' LT | 1030.00 | 1025.54 |
| 24+50.00 | 52.00' LT | 1030.00 | 1025.81 |
| 24+75.00 | 52.00' LT | 1030.00 | 1026.00 |
| 25+00.00 | 52.00' LT | 1030.00 | 1026.14 |
| 25+25.00 | 52.00' LT | 1030.00 | 1026.20 |
| 25+50.50 | 52.00' LT | 1026.70 | 1026.34 |

## TOTAL ESTIMATED QUANTITIES

| BID ITEM | BID ITEMS | UNIT | TOTALS |
|---|---|---|---|
| 513.8016 | RAILING STEEL PEDESTRIAN TYPE C3 | LF | 172 |
| 517.1010.S.003 | CONCRETE STAINING R-13-331 | SF | 802 |
| 612.0206 | PIPE UNDERDRAIN UNPERFORATED 6-INCH | LF | 30 |
| 612.0406 | PIPE UNDERDRAIN WRAPPED 6-INCH | LF | 175 |
| SPV.0165.151 | WALL MODULAR BLOCK GRAVITY R-13-331 | SF | 888 |

ALL ITEMS ARE CATEGORY 0040

## BENCHMARKS

| NO. | STATION | DESCRIPTION | ELEV. |
|---|---|---|---|
| 6 | 23+52.72 PD, 55.09' LT | TOP NUT OF FIRE HYDRANT | 1029.35 |

WISCONSIN
BRETT M. OFTEDAHL
E-41123
MADISON WI
PROFESSIONAL ENGINEER
9/20/2019

STATE PROJECT NUMBER
5849-02-02

## GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.

THE PLAN QUANTITY FOR THE BID ITEM "WALL MODULAR BLOCK GRAVITY R-13-331" IS BASED ON A WALL HEIGHT MEASURED FROM THE TOP OF WALL TO A CONSTANT DEPTH OF 1'-6" BELOW FINISHED GRADE.

ALL DIMENSIONS AND STATIONING ARE ALONG THE FRONT FACE OF WALL AT FINISHED GROUND, UNLESS OTHERWISE SHOWN.

A NAME PLATE SHALL BE PLACED AS DIRECTED BY THE ENGINEER.

BAR STEEL REINFORCEMENT FOR CAST IN PLACE CONCRETE SHALL BE EPOXY COATED.

BAR STEEL REINFORCEMENT SHALL BE EMBEDDED 2 INCHES CLEAR UNLESS OTHERWISE SHOWN OR NOTED.

BEVEL EXPOSED EDGES OF CONCRETE 3/4-INCH UNLESS NOTED OTHERWISE.

WET CAST BLOCKS ARE REQUIRED FOR THIS WALL.

## DESIGN DATA

THE CONTRACTOR SHALL PROVIDE COMPLETE DESIGN, PLANS, DETAILS, SPECIFICATIONS, AND SHOP DRAWINGS FOR THE RETAINING WALLS IN ACCORDANCE WITH THE SPECIAL PROVISIONS. THE RETAINING WALL MANUFACTURER SHALL PROVIDE TECHNICAL ASSISTANCE TO THE CONTRACTOR DURING CONSTRUCTION. THE COST OF FURNISHING THESE ITEMS SHALL BE INCLUDED IN THE BID ITEM "WALL MODULAR BLOCK GRAVITY R-13-331."

PLANS, ELEVATIONS AND DETAILS SHOWN ON THESE DRAWINGS ARE INTENDED TO INDICATE WALL LOCATIONS, LENGTHS, HEIGHTS, AND DETAILS COMMON TO THE WALL SYSTEM SELECTED. THE CONTRACTOR SHALL VERIFY THAT THE WALL SYSTEM SELECTED WILL CONFORM TO THE REQUIRED ALIGNMENTS AND DETAILS.

THE RETAINING WALL IS TO BE DESIGNED USING THE ELEVATIONS GIVEN ON THIS SHEET.

DESIGN RETAINING WALL FOR A LIVE LOAD SURCHARGE OF 100 PSF.

THE MAXIMUM VALUE OF THE ANGLE OF INTERNAL FRICTION OF THE WALL BACKFILL MATERIAL SHALL BE ASSUMED TO BE 30° WITHOUT CERTIFIED TEST VALUES.

TOP OF WALL ELEVATIONS SHOWN ARE MINIMUM VALUES. MODULAR BLOCK WALL SHALL BE STEPPED AT THE LOCATIONS DETERMINED BY THE WALL MANUFACTURER.

## ALLOWABLE WALL SYSTEMS

1. WALL MODULAR BLOCK GRAVITY

## LIST OF DRAWINGS



| NO. | DATE | REVISION | BY |
|---|---|---|---|


STRAND ASSOCIATES®
910 WEST WINGRA DRIVE
MADISON, WISCONSIN 53715
(608)-251-4843
(608) 251-8655 FAX
WWW.STRAND.COM

DESIGN CONSULTANT CONTACT:
KYLE BETH (608) 251-4843

BRIDGE OFFICE CONTACT:
WILLIAM DREHER (608) 266-8489


STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

ACCEPTED _____ _____
CHIEF STRUCTURES DESIGN ENGINEER — DATE

# STRUCTURE R-13-331

RETAINING WALL ALONG MCKEE ROAD

COUNTY: DANE — ~~TOWN/CITY/VILLAGE~~: FITCHBURG

DESIGN SPEC.: AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

| DESIGNED BY | DESIGN CK'D. | DRAWN BY | PLANS CK'D. |
|---|---|---|---|
| KPB | BMO | DTH | BMO |

GENERAL PLAN

SHEET 1 OF 4

8

8

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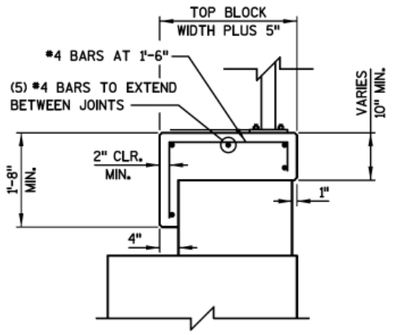


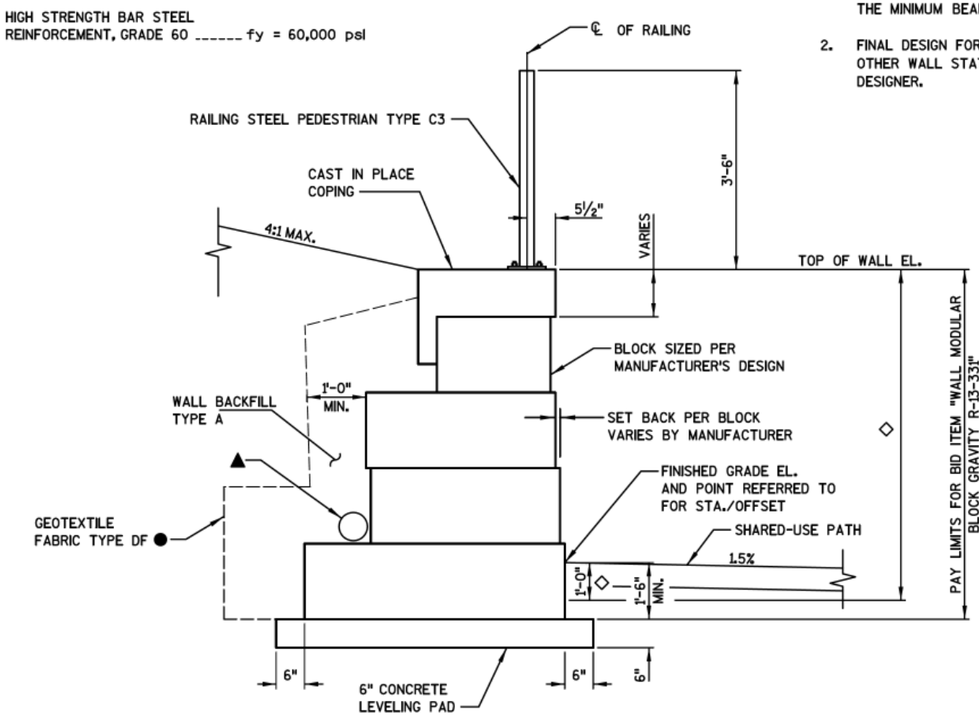

## CAST IN PLACE CONCRETE COPING DETAIL

NOTE:
BAR STEEL REINFORCEMENT AND CAST IN PLACE CONCRETE TO BE INCLUDED IN BID ITEM "WALL MODULAR BLOCK GRAVITY R-13-331"

DO NOT RUN BAR STEEL THRU EXPANSION OR CONTRACTION JOINT.

MATERIAL PROPERTIES:
CONCRETE MASONRY _____ fc'= 3,500 psi

HIGH STRENGTH BAR STEEL
REINFORCEMENT, GRADE 60 _____ fy = 60,000 psi




## WALL MODULAR BLOCK GRAVITY TYPICAL SECTION

PRECAST MODULAR BLOCK TEXTURE SHALL BE SELECTED BY ENGINEER FROM MANUFACTURER'S STANDARD OPTIONS.

▲ PIPE UNDERDRAIN WRAPPED 6-INCH. SLOPE 0.5% MIN. TO CONNECT TO STRUCTURE W106.4

● GEOTEXTILE FABRIC SHALL COMPLETELY SEPARATE WALL BACKFILL TYPE A FROM BACKFILL ON ALL SIDES.

◇ APPLY CONCRETE STAINING FROM TOP OF CAST IN PLACE COPING TO 1'-0" BELOW FINISHED GRADE ELEVATION.

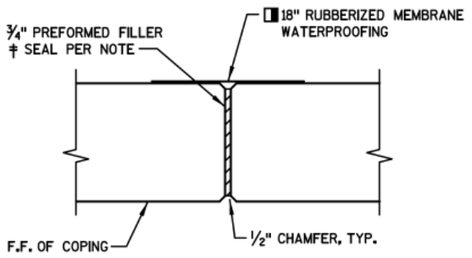
## WALL EXTERNAL & OVERALL STABILITY EVALUATION

| DIMENSIONS | EVALUATED LOCATIONS | |
|---|---|---|
| WALL HEIGHT (FEET)[1] | 6.14 | 5.11 |
| EXPOSED WALL HEIGHT (FEET) | 4.64 | 3.61 |
| WALL STATION | -- | -- |
| BORING USED | RW-3 | RW-4 |
| CAPACITY TO DEMAND RATIO (CDR)[2,3] | | |
| SLIDING (CDR>1.0) | 1.3 | 1.0 |
| ECCENTRICITY (CDR>1.0) | 1.1 | 1.2 |
| OVERALL STABILITY (CDR>1.0) | 5.9 | -- |
| BEARING RESISTANCE (CDR>1.0) | 2.6 | 1.2 |
| FACTORED BEARING RESISTANCE (PSF) | 4,700 | 1,700 |

NOTES:
1. THE WALL HEIGHT INCLUDES AN EMBEDMENT OF 1.5 FT.
2. THE WALL STABILITY EVALUATION INCLUDED A SURCHARGE LOAD OF 100 PSF.
3. CDR VALUES ARE PRESENTED IN CHAPTER 14 OF THE WISDOT BRIDGE MANUAL.

* FINAL DESIGN FOR SLIDING, ECCENTRICITY, AND BEARING RESISTANCE IS THE RESPONSIBILITY OF THE CONTRACTOR'S WALL DESIGNER.

NOTES:
1. THE PROJECT SOILS ENGINEER SHOULD REVIEW THE SUBSURFACE CONDITIONS PRIOR TO CONSTRUCTION OF THE WALLS TO DETERMINE IF THE SOILS HAVE THE MINIMUM BEARING STRENGTH SHOWN IN THE TABLE ABOVE.
2. FINAL DESIGN FOR SLIDING, ECCENTRICITY, AND BEARING RESISTANCE AT OTHER WALL STATIONS IS THE RESPONSIBILITY OF THE CONTRACTOR'S WALL DESIGNER.

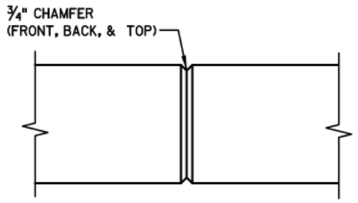



## COPING EXPANSION JOINT

DO NOT RUN BAR STEEL THRU JOINT.
MAX. SPACING OF JOINT = 50'

◨ MEMBRANE WATERPROOFING TO EXTEND FROM TOP OF COPING TO BOTTOM OF COPING. MEMBRANE WATERPROOFING INCLUDED IN BID ITEM "WALL MODULAR BLOCK GRAVITY R-13-331".

‡ SEAL ALL EXPOSED HORIZ. & VERT. SURFACES OF FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER. (1" DEEP AND HOLD ⅛" BELOW SURFACE OF CONCRETE.)




## COPING CONTRACTION JOINT

DO NOT RUN BAR STEEL THRU JOINT. MAX. SPACING OF JOINT = 12'. SET JOINT LOCATION TO ALIGN WITH MODULAR BLOCK JOINT BELOW.

STATE PROJECT NUMBER
5849-02-02

## SOIL PARAMETERS

| STRATUM LOCATIONS & SOIL DESCRIPTIONS | TOTAL UNIT WEIGHT | FRICTION ANGLE (DEGREES) | COHESION (PSF) |
|---|---|---|---|
| GRANULAR BACKFILL (REINFORCING ZONE OR BACKFILL) | 120 | 30 | 0 |
| GRANULAR RETAINED SOIL * | 135 | 30 | 0 |
| BOR RW-3 | | | |
| LEAN CLAY ELEV 1032.0-1030.8 | 130 | -- | 1,500 |
| LEAN CLAY ELEV 1030.8-1029.0 | 123 | 0 | 1,500 |
| LEAN CLAY ELEV 1029.0-1028.0 | 123 | 0 | 900 |
| SITLY SAND WITH GRAVEL AND COBBLES ELEV 10285.0-1026.5 | 135 | 33 | 0 |
| SILTY SAND WITH GRAVEL AND COBBLES ELEV 1026.5-1019.5 | 135 | 36 | 0 |
| CLAYEY SAND WITH GRAVEL AND COBBLES ELEV 1019.5-1015.0 | 135 | 34 | 0 |
| CLAYEY SAND WITH GRAVEL AND COBBLES ELEV 1015.0-1010.0 | 135 | 37 | 0 |
| CLAYEY SAND WITH GRAVEL AND COBBLES ELEV 1010.0-1007.5 | 135 | 31 | 0 |
| SANDSTONE ELEV 1007.5-1007.0 | 120 | 33 | 0 |
| BOR RW-4 | | | |
| SITLY SAND WITH GRAVEL ELEV 1030.1-1029.8 | 135 | 35 | 0 |
| LEAN CLAY ELEV 1029.8-1028.9 | 130 | 0 | 1,200 |
| LEAN CLAY ELEV 1028.9-1026.1 | 123 | 0 | 1,500 |
| CLAYEY SAND ELEV 1026.1-1025.6 | 125 | 26 | 0 |
| SILTY SAND ELEV 1025.6-1024.6 | 135 | 37 | 0 |
| SILTY SAND WITH GRAVEL AND COBBLES ELEV 1024.6-1021.6 | 135 | 37 | 0 |
| POORLY-GRADED SAND ELEV 1021.6-1018.1 | 115 | 40 | 0 |
| SILT ELEV 1018.1-1015.6 | 135 | 35 | 0 |
| CLAYEY SAND WITH GRAVEL AND COBBLES ELEV 1015.6-1007.1 | 135 | 35 | 0 |
| SANDSTONE ELEV 1007.1-1006.5 | 120 | 45 | 0 |

| NO. | DATE | REVISION | BY |
|---|---|---|---|
| | | | |

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

STRUCTURE R-13-331

DRAWN BY DTH | PLANS CK'D. BMO

WALL DETAILS

SHEET 2

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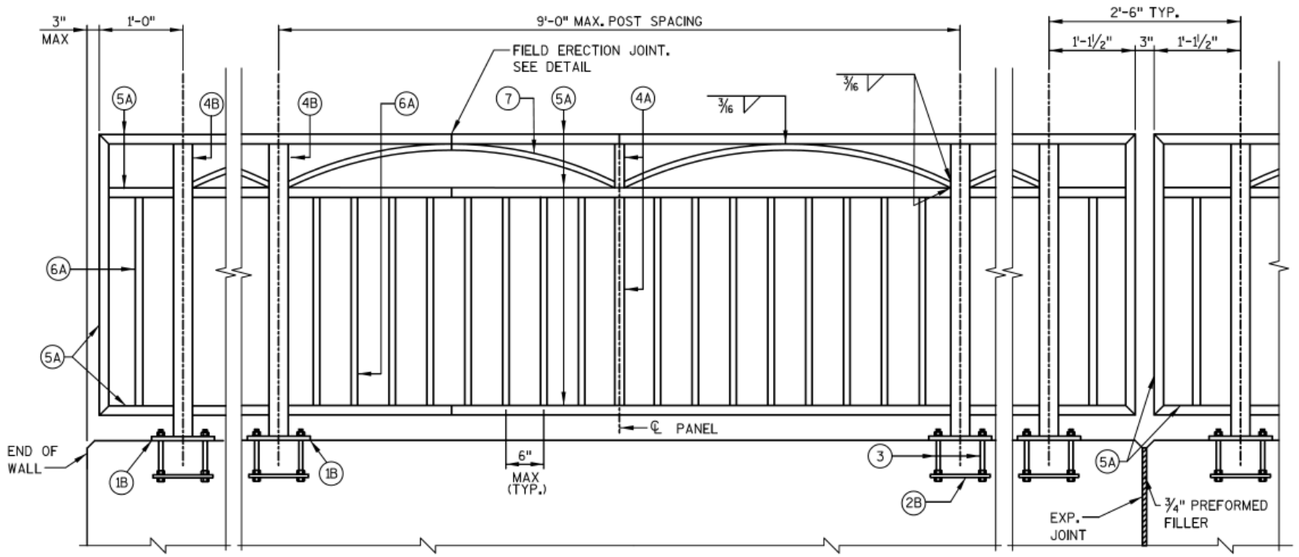
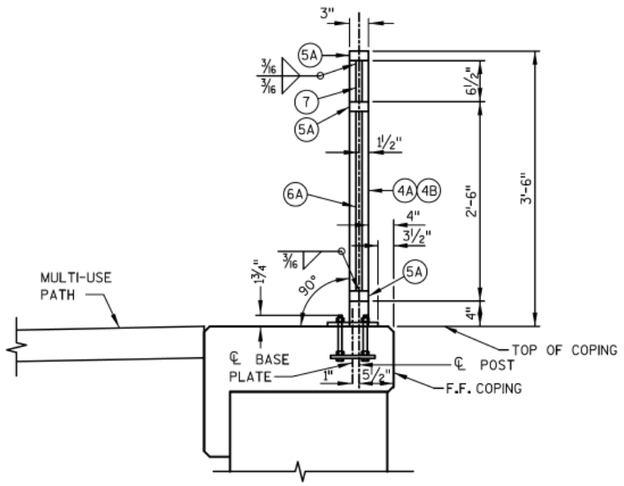
STATE PROJECT NUMBER

5849-02-02

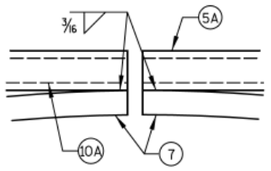



ELEVATION TYPE C3 MODIFIED

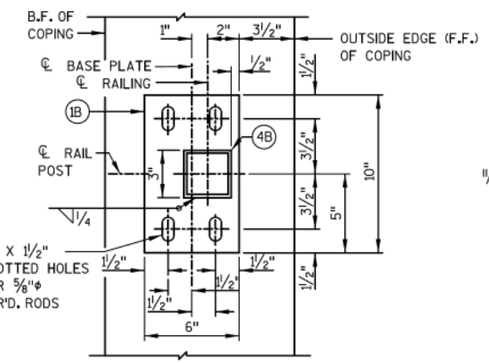
RAILING AT EXPANSION JOINT



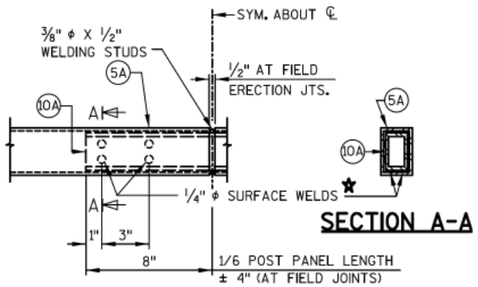

SECTION THRU RAILING




FIELD ERECTION JOINT



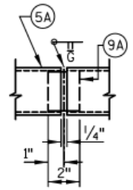

TYPICAL RAIL POST BASE PLATE




SECTION A-A

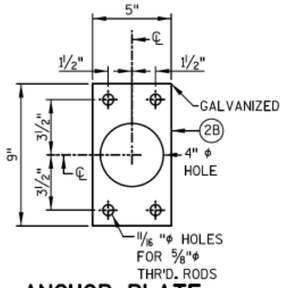
FIELD ERECTION JOINT DETAIL

★ MIN. ⅝" FLAT SURFACE DIA. PUNCHINGS OR STUDS MAY BE USED AS AN ALTERNATE.

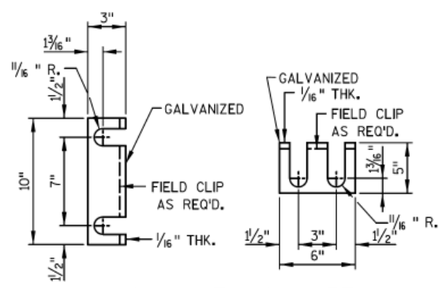



SHOP RAIL SPLICE DETAIL

(LOCATION MUST BE SHOWN ON SHOP DRAWINGS)

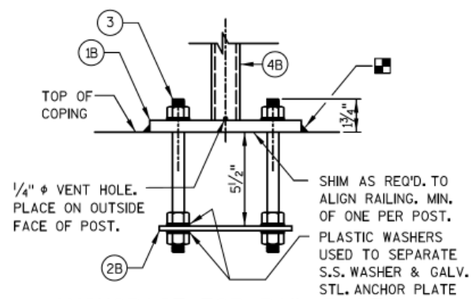



ANCHOR PLATE




RAIL POST SHIM DETAIL

(2 SETS PER POST)




ANCHORAGE FOR RAIL POSTS

NOTE: ANCHOR PLATE NOT REQUIRED WHEN ADHESIVE ANCHORS ARE USED.

## LEGEND

(1B) PLATE ⅝" X 6" X 10" WITH ¾" X 1½" SLOTTED HOLES

(2B) ¼" X 5" X 9" ANCHOR PLATE WITH 11/16 " φ HOLES FOR THR'D. RODS NO. 3.

(3) ⅝" DIA. X 9" LONG, TYPE 316 STAINLESS STEEL THREADED RODS (MIN. TENSILE STRENGTH = 70 KSI) WITH NUT AND WASHERS OF SAME ALLOY GROUP. ALTERNATE ANCHORAGE: CONCRETE ADHESIVE ANCHORS ⅝-INCH. EMBED 7" IN CONCRETE FOR RAIL POSTS. ADHESIVE ANCHORS SHALL CONFORM TO SECTION 502.2.12 OF THE STANDARD SPECIFICATIONS.

(4A) STRUCTURAL TUBING 3" X 1½" X 3/16". PLACE VERTICAL. WELD TO NO. 1 & 5.

(4B) STRUCTURAL TUBING 3" X 3" X 3/16". PLACE VERTICAL. WELD TO NO. 1 & 5.

(5A) STRUCTURAL TUBING 3" X 1½" X 3/16" RAILS. WELD TO NO. 1 & NO. 4. INSIDE OF TUBE TO BE PAINTED AT ALL FIELD ERECTION JOINTS.

(6A) BAR 1" X 1" PICKETS. WELD TO NO. 5. (SPACE AT 6" MAX ℄ TO ℄ SPACING). PLACE VERTICAL.

(7) BAR 1" X 1". BEND TO REQUIRED RADIUS. WELD TO NO. 4 & 5.

(9A) RECTANGULAR SLEEVE FABRICATED FROM 3/16" PLATES. PROVIDE "SLIDING FIT".

(10A) RECTANGULAR SLEEVE FABRICATED FROM 3/16" PLATES. (1'-4" ℄ FIELD ERECTION JTS.)

## RAILING NOTES

BID ITEM SHALL BE "RAILING STEEL PEDESTRIAN TYPE C3", WHICH SHALL INCLUDE ALL STEEL ITEMS SHOWN.

POST BASE PLATES SHALL BE FLAT WITH ALL SURFACES SMOOTH AND FREE FROM WARP AND ALL EDGES SMOOTH, STRAIGHT AND VERTICAL. ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUTS.

ALL PLATES, BARS, AND RECTANGULAR SLEEVES SHALL CONFORM TO ASTM A709 GRADE 36. ALL STRUCTURAL TUBING SHALL CONFORM TO ASTM A500 GRADE B.

ANCHORAGES SHALL BE ACCURATELY PLACED TO PROVIDE CORRECT ALIGNMENT OF RAILING. SET NORMAL TO GRADE.

CUT BOTTOM OF POST TO MAKE POST VERTICAL IN BOTH TRANSVERSE AND LONGITUDINAL DIRECTION.

STEEL SHIMS SHALL BE PROVIDED & USED UNDER BASE PLATES WHERE REQUIRED FOR ALIGNMENT, AND SHALL BE GALVANIZED.

■ CAULK AROUND PERIMETER OF BASE PLATES, NO. 1, AND FILL BOLT SLOT OPENINGS IN SHIMS AND BASE PLATES WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.

ALL MATERIAL (EXCEPT NO. 3) SHALL BE GALVANIZED AFTER FABRICATION. PRIOR TO GALVANIZING, THE STEEL RAILING SHALL BE GIVEN A NO. 6 BLAST CLEANING PER SSPC SPECIFICATIONS. PAINT OVER GALVANIZING WITH AN APPROVED TIE COAT AND TOP COAT AS SPECIFIED IN THE CONTRACT DOCUMENTS. THE RAILING SHALL BE PAINTED FEDERAL COLOR NO. 14090 (GREEN).

VENT HOLES SHALL BE DRILLED IN POST AND RAIL MEMBERS AS REQUIRED TO FACILITATE GALVANIZING AND DRAINAGE.

RAILING SHALL BE FABRICATED IN LENGTHS THAT INCLUDE 3 OR 4 POSTS.

TOUCH-UP PAINTING TO BE DONE AT COMPLETION OF STEEL RAILING INSTALLATION TO THE SATISFACTION OF THE ENGINEER AT NO EXTRA COST.

COORDINATE POST LAYOUT WITH WALL COPING EXPANSION JOINT LAYOUT.

| NO. | DATE | REVISION | BY |
|---|---|---|---|

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

STRUCTURE R-13-331

DRAWN BY DTH | PLANS CK'D. BMO

RAILING DETAILS | SHEET 3

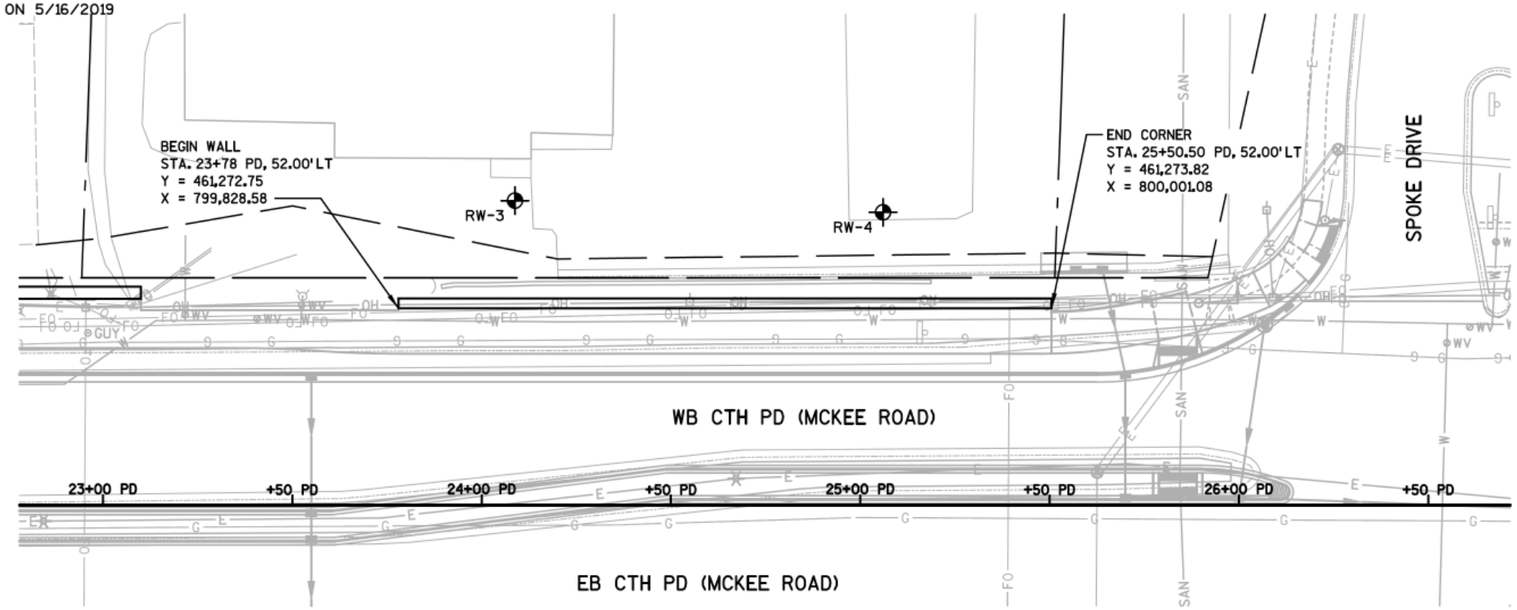
8

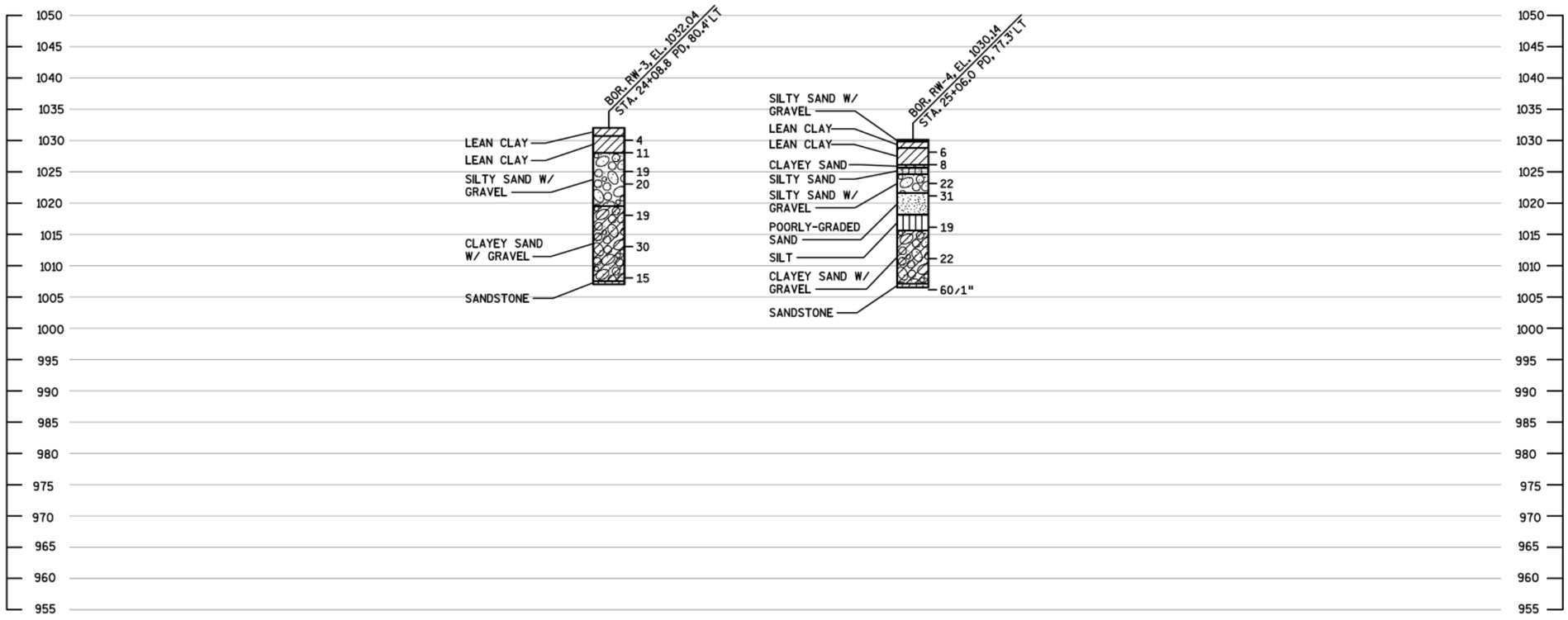
8

FILE NAME : S:\MAD\1200--1299\1275\027\Micros\PLAN\080203_wd.dgn

BORINGS PERFORMED AND REPORT COMPLETED BY:
SOILS & ENGINEERING SERVICES, INC. (SES)
1102 STEWART STREET
MADISON, WI 53713

BORINGS WERE PERFORMED ON 5/16/2019



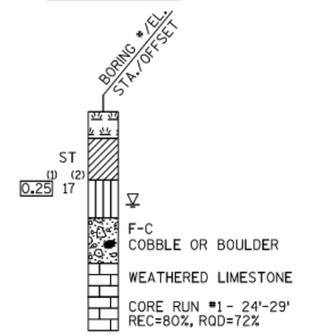

STATE PROJECT NUMBER

5849-02-02

MATERIAL SYMBOLS

| | | |
|---|---|---|
| ASPHALT | TOPSOIL | PEAT |
| CONCRETE | FILL | GRAVEL |
| SAND | CLAY | SILT |
| BOULDERS OR COBBLES | LIMESTONE | BEDROCK (UNKNOWN) |
| SHALE | SANDSTONE | IGNEOUS/ META |

LEGEND OF BORING




(1) UNCONFINED STRENGTH, AS DETERMINED BY A POCKET PENETROMETER (TSF)

(2) UNLESS OTHERWISE, SPECIFIED THE SPT 'N' VALUE IS BASED ON AASHTO T-206, STANDARD PENETRATION TEST. THE SPT 'N' VALUE PRESENTED HAS NOT BEEN CORRECTED FOR OVERBURDEN PRESSURE OR HAMMER EFFICIENCY.

GROUND WATER ELEVATION

- AT TIME OF DRILLING
- END OF DRILLING
- AFTER DRILLING

ABBREVIATIONS

F-FINE M-MEDIUM C-COARSE ST-SHELBY TUBE

SUBSURFACE EXPLORATION FOR FOUNDATION DESIGN AND BIDDERS INFORMATION

BORINGS WERE COMPLETED AT POINTS APPROXIMATELY AS INDICATED ON THIS DRAWING TO OBTAIN INFORMATION CONCERNING THE CHARACTER OF SUBSURFACE MATERIALS FOUND AT THE SITE. BECAUSE THE INVESTIGATED DEPTHS ARE LIMITED AND THE AREA OF THE BORINGS IS VERY SMALL IN RELATION TO THE ENTIRE SITE, THE WISCONSIN DEPARTMENT OF TRANSPORTATION DOES NOT WARRANT SIMILAR SUBSURFACE CONDITIONS BELOW, BETWEEN, OR BEYOND THESE BORINGS. VARIATIONS IN SOIL CONDITIONS SHOULD BE EXPECTED AND FLUCTUATIONS IN GROUNDWATER LEVELS MAY OCCUR.

| NO. | DATE | REVISION | BY |
|---|---|---|---|
| | | | |

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN SECTION

STRUCTURE R-13-331

DRAWN BY DTH | PLANS CK'D. BMO

SUBSURFACE EXPLORATION

SHEET 4

8

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SCALE =

FILE NAME : S:\MAD\1200--1299\1275\027\Micros\PLAN\080204_sx.dgn